

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	6.3mΩ@10V	40A
	9.5mΩ@4.5V	



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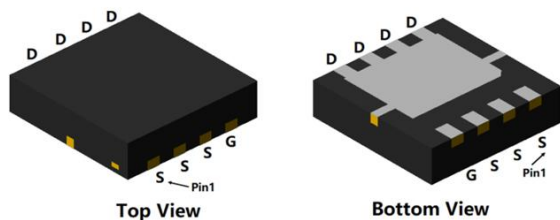
Feature

- Fast switching speed
- Low On-Resistance
- 100% Single Pulse avalanche energy Test

Applications

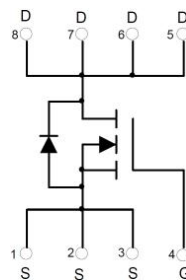
- DC-DC Converters.
- Power Management

Package

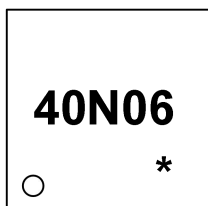


PDFN3X3-8L

Circuit diagram



Marking



40N06
*

:Device Code
:Month Code

Order Information

Device	Package	Unit/Tape
SP40N06NJ	PDFN3X3-8L	5000

Absolute maximum ratings (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	40	A
Pulse Drain Current Tested	I_{DM}	160	A
Single Pulse Avalanche Energy ¹	E_{AS}	72	mJ
Power Dissipation (Tc=25°C)	P_D	40	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	3	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

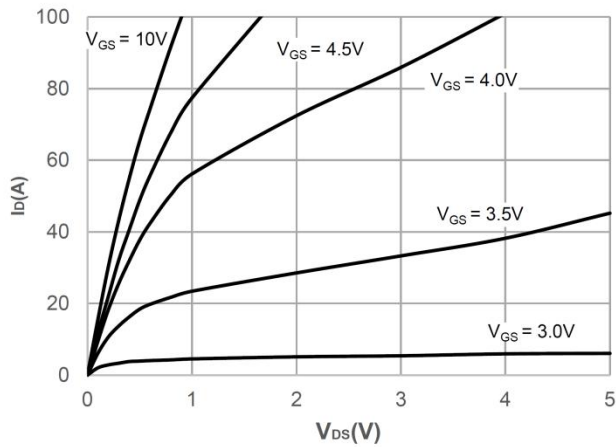
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	40	-	-	V
Drain-Source Leakage Current	IDSS	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=10V, ID=8A	-	6.3	8.5	mΩ
		VGS=4.5V, ID=4A	-	9.5	12	mΩ
Dynamic characteristics						
Input Capacitance	Ciss	VDS=20V , VGS=0V , f=1MHz	-	1733	-	pF
Output Capacitance	Coss		-	283	-	
Reverse Transfer Capacitance	Crss		-	141	-	
Switching Characteristics						
Total Gate Charge	Qg	VDS=20V , VGS=20V , ID=10A	-	8.3	-	nC
Gate-Source Charge	Qgs		-	2.4	-	
Gate-Drain Charge	Qgd		-	3.4	-	
Turn-On Delay Time	Td(on)	VDD=20V, VGS=10V , RG=3Ω, ID=2A	-	3.5	-	nS
Rise Time	Tr		-	3.7	-	
Turn-Off Delay Time	Td(off)		-	17.1	-	
Fall Time	Tf		-	6.4	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Diode Continuous Current	IS		-	-	40	A
Reverse recover time	Trr	IS=20A, di/dt=100A/us, Tj=25℃	-	15	-	nS
Reverse recovery charge	Qrr		-	3	-	nC

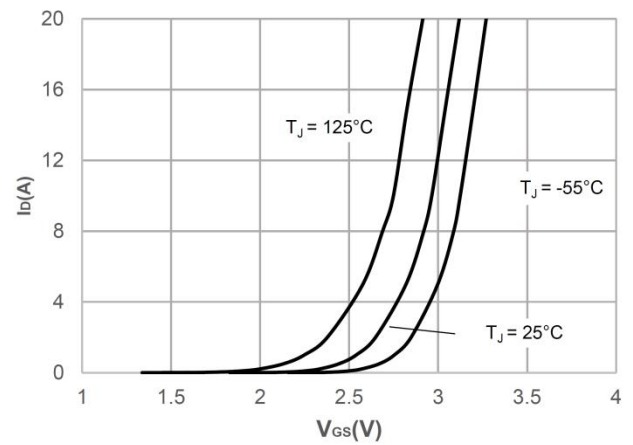
Note:

- The EAS test condition is $V_{DD}=20V, V_G=10V, L=0.1mH, R_g=25\Omega$

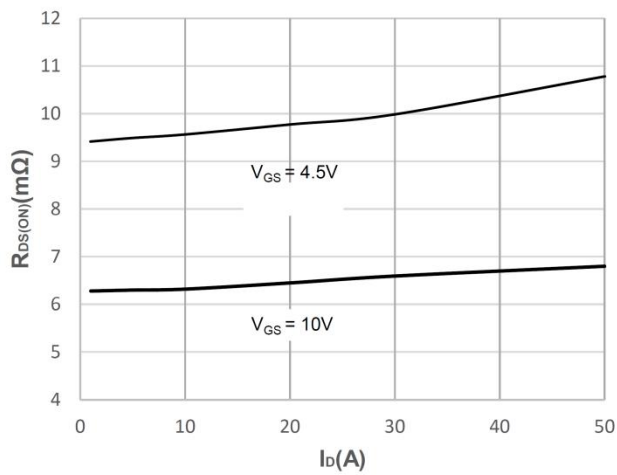
Typical Characteristics



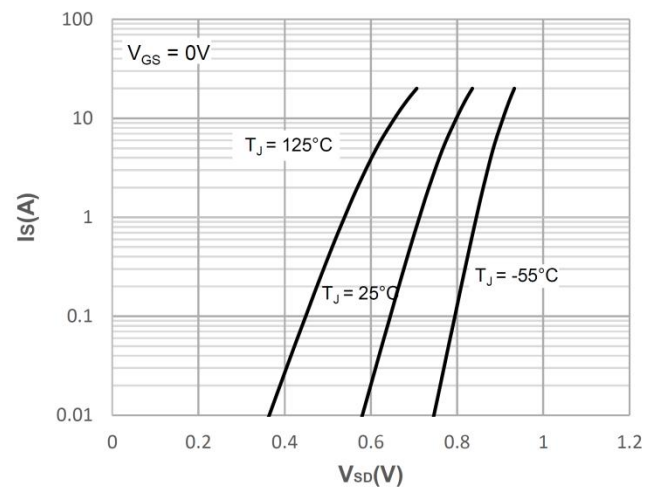
Output Characteristics



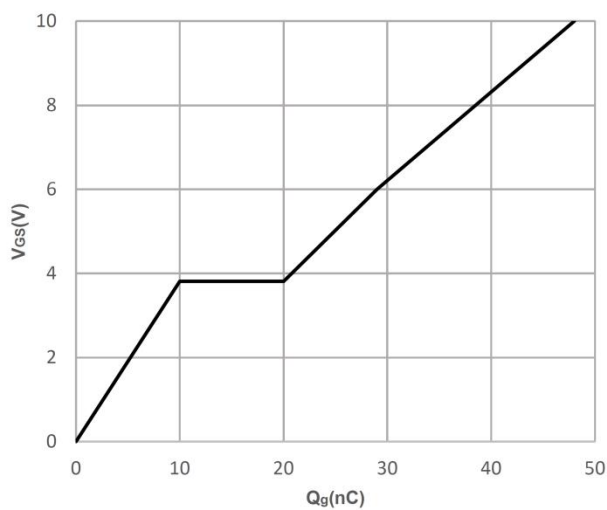
Typical Transfer Characteristics



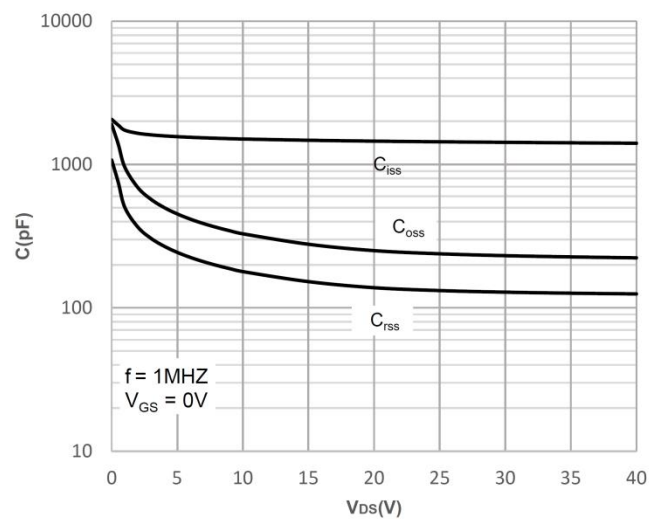
On-resistance vs. Drain Current



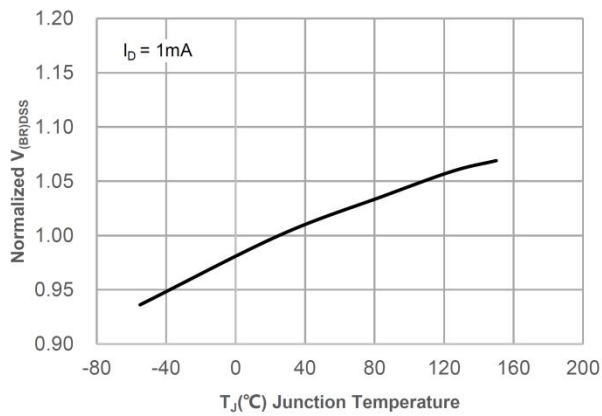
Body Diode Characteristics



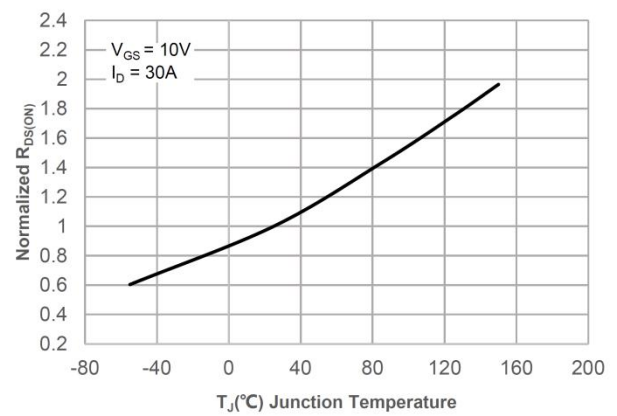
Gate Charge Characteristics



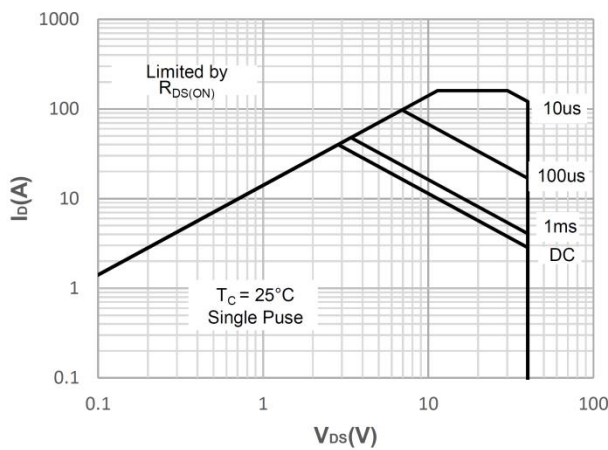
Capacitance Characteristics



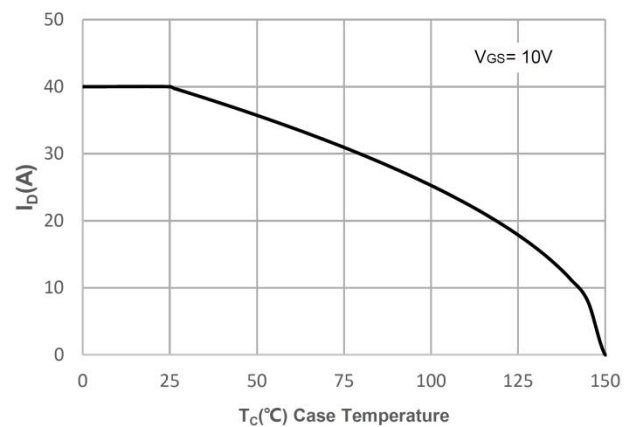
Normalized Breakdown voltage vs. Junction Temperature



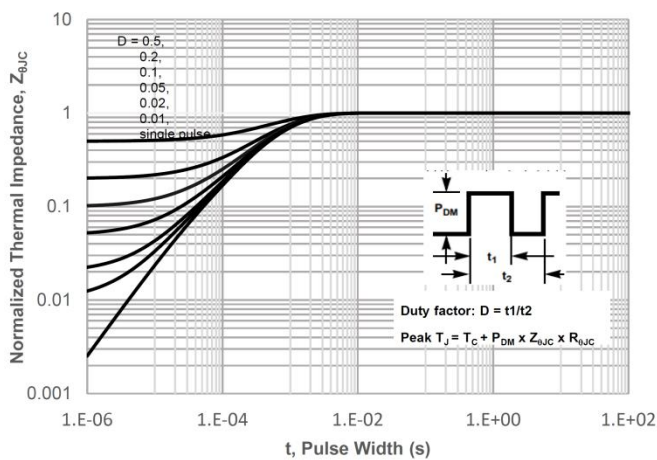
Normalized on Resistance vs. Junction Temperature



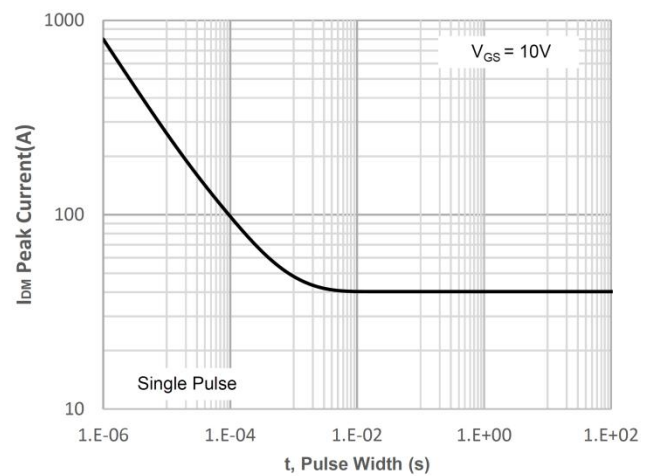
Maximum Safe Operating Area



Maximum Continuous Drain Current vs. Case Temperature



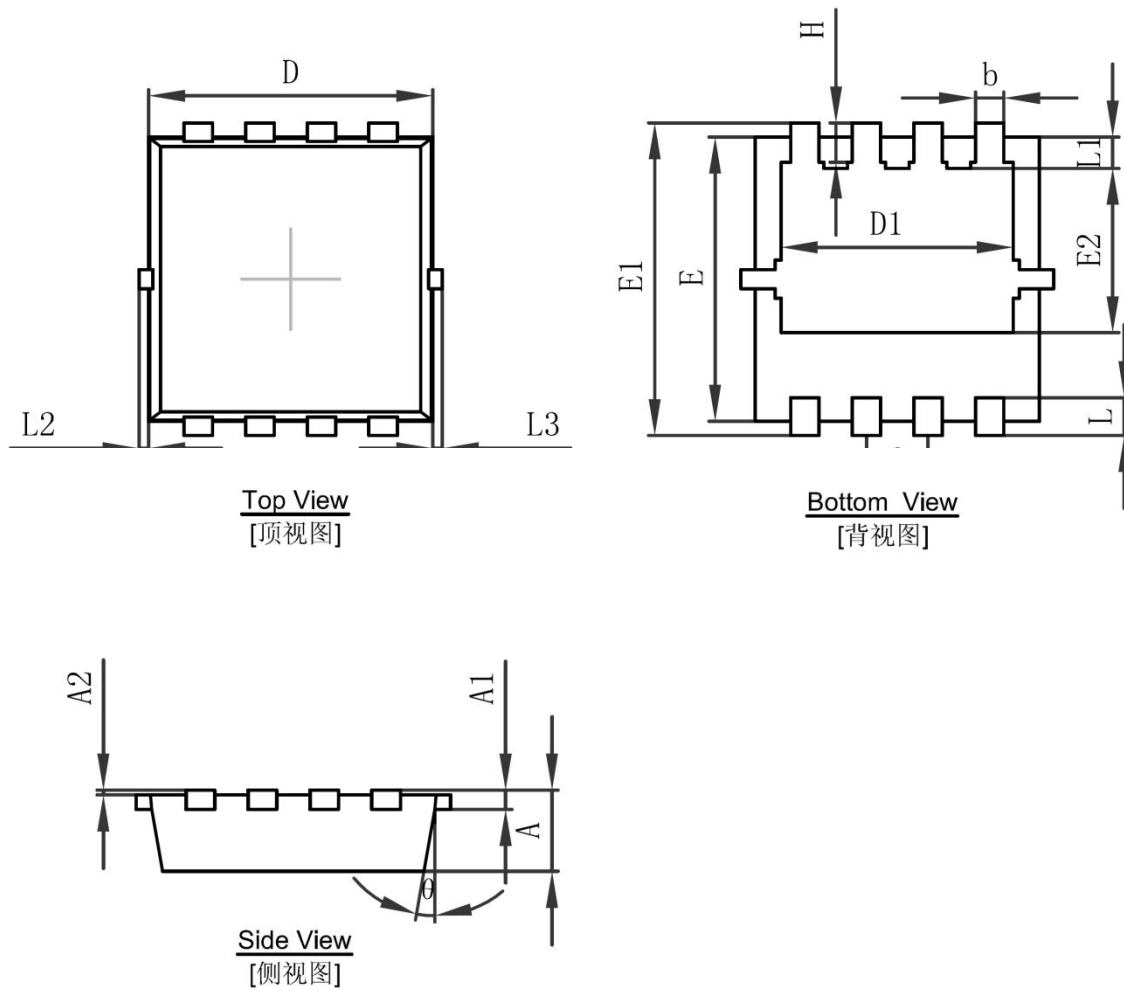
Normalized Maximum Transient Thermal Impedance



Peak Current Capacity



PDFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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